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ABSTRACT

A study was conducted in New York State to quantify the investment made in selected occupational programs at public two-year colleges and the returns from this investment to graduates, employers, and the state government. A survey was mailed to a representative sample of New York State employers with 100 or more employees, covering areas of technician hiring practices, salary differentials based on education and experience, training preferences, and alternative hiring preferences. In addition, a sample of 15 public two-year colleges was surveyed for information on technical training costs, placement information, number of graduates, revenue sources, and related topics. Survey responses from 85 of 152 firms and 11 of 15 colleges were synthesized to produce estimates of training costs in data processing, health service/paramedical, engineering/mechanical, and business/commerce technologies; and estimates of the benefit streams derived. Study findings included the following: (1) employers indicated that schools were not a major source of skilled workers; (2) on a statewide basis there was a misalignment between the supply of graduates in the disciplines and the positions available in those disciplines; and (3) in health service/paramedical fields, and to some extent in business/commerce, the salary differential for two-year college graduates was not enough to create competitive rate of return over a 10 to 20 year period. The study report discusses the implications of the findings for educational policy and future study. (HB)

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EXECUTIVE SUMMARY

DETERMINING THE ECONOMIC RETURNS ON INVESTMENT IN SELECTED OCCUPATIONAL EDUCATION PROGRAMS

Prepared for:

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EXECUTIVE SUMMARY

Purpose and Objectives of the Study

This study was undertaken for the New York State Education Department to determine the economic return on investment in selected occupational education programs at public two-year colleges in New York State.

The purpose of the study was to quantify: (1) the investment made in selected disciplines by the graduates, employers, and state government, and (2) the returns from this investment: to the graduate--as measured by salary differentials of technicians with two-year degrees, to the employer in New York State--as measured by the savings to business attributable to not having to train their own technicians, and to the state government and residents--as measured by the economic benefit to the state resulting from maintaining employers who might otherwise leave, not expand or expand elsewhere because of a lack of trained technicians in New York State.

The focus of research was on two-year technical training in four selected disciplines: (1) Data Processing, (2) Health Service/Paramedical, (3) Engineering/Mechanical, and (4) Business/Commerce technologies.

Project objectives included the undertaking of a statewide mailed survey of a representative sample of New York State employers with 100 or more employees, covering areas of technician hiring practices, salary differentials for education and experience, training preferences, and alternative hiring preferences. In addition, a sample of public two-year schools was surveyed separately for information on technician training costs, placement information, number of graduates, revenue sources and related topics. Data

from employers and schools were synthesized to produce estimates of (1) training costs in each discipline, and (2) benefit streams derived by the graduate, the employer and governmental jurisdictions.

Methodology Used in the Study

One hundred eighty-six firms operating in New York State were selected to be representative by Standard Industrial Classification (SIC), size of firm, and geographic distribution of all New York State employers with 100 or more employees. Of these, 152 agreed initially to participate in the survey, and were mailed a survey form to complete; 85 were returned (a 55 percent response rate). One question asked employers to identify public two-year institutions from which they had hired technical employees in recent years. The resulting list provided the basis for selecting a sample of schools for the school survey. Fifteen schools received the mailed survey; eleven returned sufficient information to be included in the school analysis.

Major Findings of the Study

The information provided by employers and schools characterizing the demand for and supply of two-year graduates yielded the following findings:

- Estimation of the statewide distribution of technical job openings in 1982 in firms of over 100 employees shows that the largest share was in the Engineering/Mechanical area (41.3 percent), followed by Health Service/Paramedical (23.8 percent), Business/Commerce (20.9 percent), and Data Processing (13.9 percent).
- The distribution of public two-year graduates in 1982, within selected disciplines, shows that the largest share was in Business/Commerce (54.7 percent), followed by Engineering/ Mechanical (21 percent), Health Service/Paramedical (16.5 percent), and Data Processing (7.8 percent).

- The distribution of technical positions filled in 1982, by industry, shows a dominance of financial/insurance/real estate (31.4 percent), service firms (27.6 percent), and manufacturing (21.5 percent).

- Employers indicate that schools are not a major source of skilled workers. Most hiring is done from the existing labor force.

- Comparisons of entry salaries received by two-year graduates and entry salaries specified by employers for jobs requiring a two-year degree indicate that the average graduate salary is typically lower than that specified by the employer for two-year jobs. This is particularly true in Business and Commerce where the salaries reported by the graduates average 30 percent less that those offered by the employer. This could be due to supply/demand conditions and/or misalignment of curriculum content and employer requirements.

- Employer hiring/training preferences differ among the various disciplines studied. While most employers prefer to hire skills in all areas, their post-hiring training practice differs by discipline. Generally, positions in the areas of Business/ Commerce and Data Processing are reported to require more training once hired. This is possibly due to more operation-specific skill requirements in these areas. If this is the case, the graduates' entry-level salary may be somewhat discounted in these fields since employers perceive the need for additional investment in operation-specific training.

- While student costs are reasonably uniform among the selected disciplines, the school program costs per degree are shown to vary widely from an estimated low of approximately $5,700 for Business/Commerce degrees to a high of $9,800 for Health Service and Paramedical degrees in community colleges.

- On a statewide basis there is misalignment between the distribution of public two-year school graduates supplied in the selected disciplines and the distribution of technical positions available from employers (with over 100 employees) in those disciplines. If the supply of graduates is larger than required, the graduates will more often be faced with accepting jobs below their capabilities, or outside their fields; hence, the lower salaries. Also, in Business/ Commerce the jobs for which graduates are trained (e.g., secretarial science) may not be those for which employers require a two-year degree; hence, the salaries received may be those for which the employers specify a high school degree.

Employer and school information together permitted the estimation of the economic rates of return on investment and payback periods for the four disciplines studied. These calculations showed:

- Graduate returns on investment in all disciplines except Health Service and Paramedical are shown to be competitive over a 10-20 year period. The rate of return varies substantially primarily due to the comparative salary levels for jobs requiring a high school degree. In Health Service, and to a certain extent in Business/Commerce, the salary differential is not enough to create a competitive rate of return over the short run (i.e., 10-20 years).

- It is likely that employers receive a net benefit from their tax investment in two-year education, since their higher cost training alternatives (which would be necessary if there was an inadequate supply of graduates) are more costly than the average business share of a graduate's education.

- State residents are paying less than $12.00 per capita each year to finance public two-year school enrollments of approximately 260,000 students. Although it is impossible to estimate the economic returns on a statewide basis from such an investment it is likely that there are substantial direct and indirect economic gains due to economic activity of the school employees, students, support industries, and the maintenance of expanding or new businesses which may choose to go outside of New York State if a skilled labor force is not readily available.

- Payback periods and rates of return are sensitive to alterations of any of the assumptions constraining the analysis (e.g., time frame of analysis, likelihood of employment, price factors).

Consideration of the outlook for graduates of two-year technical training programs in light of present and projected economic and demographic trends provided the context for the following inferences:

- The misalignment of the distribution of graduates supplied in the selected disciplines and the distribution of technical positions available from employers can be expected to shift over the coming years. Employment and occupation projections

suggest that if two-year schools maintain their current curricula, the misalignment could worsen. It is clear that it will be even more important in the future for businesses to evaluate and articulate their needs for technically trained employees. A continual attentiveness and responsiveness to business needs will be required of two-year schools to adequately prepare their graduates to be competitive in the labor force.

- The outlook for the 1980s indicates continued competition for entry level jobs; even though the college age group is decreasing in size, there will be an increasing percentage of other first-time entrants to the labor force who will also be seeking entry-level employment. Additionally, the labor force will be increasingly educated and employers may continue to raise educational requirements for jobs.

Conclusions

It is commonly assumed that investment in post-secondary education will not only increase an individual's employability but also provide the graduate with a respectable economic return (received from higher future wages). The findings from the study cast doubt on the latter assumption, suggesting that, in the short run at least, returns on investment may not justify the investment in some disciplines.

It can be concluded from this study that active participation between employers and two-year public schools is necessary in order to serve current and future technical needs of employers within New York State. In order for this to occur it is encumbant upon employers to articulate their needs to two-year schools in the state and for the schools to respond to those needs within the resources available. To the extent that employers benefit, the graduate will maximize their return from investment in post-secondary education. Currently, there are indications that there not only may be misalignment of employer demand and graduate supply among selected disciplines, but there also may be misalignment within disciplines between the employers' technical needs and the curriculum provided by the two-year schools.

Since resources for post-secondary education are limited, it is imperative that there is an efficient allocation of school training efforts. Employers and schools should be expected to continue in their attempts to maximize graduate, employer, and state returns from investment in two-year education. It is particularly important to increase the effectiveness of training since post-secondary education may become a prerequisite for employment, regardless of the graduate return on investment.

Policy Implications/Need for Further Study

The study findings and conclusions outlined above suggest implications for education policy and for further study in this and other areas.

First, it is clear that linkages between the employers and schools should be stressed in order to communicate the needs of the employer today and tomorrow. This should include additional attention to the smaller employer who has generally not been a focus of the two-year system.

Better linkages should offer the schools more useful information for planning purposes than currently exists. For example, there is mixed opinion today as to whether the way of the future is in high technology (with extensive math and science background) or in basic skills (e.g., English) for communication and learning on-the-job. High technology may not add the jobs envisioned by some, and may in fact "deskill" many jobs as they become more mechanized and routine. This could lead to less demand and lower wages for technical graduates.[1] What is clear, nonetheless, is that an increased

[1]Henry Levin and Russell Rumberger, The Educational Implications of High Technology, February, 1983.

attentiveness to broad based employment trends will allow schools to more accurately gauge the market for the graduates they train.

Second, the school system should be prepared to shift resources as it becomes apparent that demand/yields are low in selected areas. Options such as employer-based skill training and a system of recurrent education may help in this area. Employer-based training (e.g., cooperative education) may be one way to limit investment in equipment and faculty in order to maintain flexibility, and to better focus on the needs and demands of specific firms and occupations. A system of recurrent education would be appropriate to meet the continually evolving needs of industry. In short, schools could benefit (and hence so could graduates) from a reorientation to technical training as an evolutionary process, not a static choice at one point in time.

Finally, graduates must be better prepared to adapt to changes in the work environment over time. This suggests that they should receive a good basic education in addition to vocational training in order to have the skills necessary to adapt to change. Schools can assist in this regard by ensuring, through distribution requirements and--if necessary-intensive remedial programs, that graduates have the capability to accommodate changing demands for skills.

Improvements in this area will be facilitated by additional study of the factors that contribute to the varying yields seen in the disciplines reviewed in this study. Efforts in this area will produce a better understanding of the dynamics of school/employer linkages, cooperative education and other approaches which may contribute to increased yields in the system of two-year education.

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